

# Evolutionary Acquisition and Spiral Development

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# Definition of Terms

- ◆ **Evolutionary Acquisition** (EA) is an acquisition strategy that develops and fields an initial capability and continues the development and production of the system to provide additional capability over time as *technology matures*.
- ◆ **Spiral Development** (SD) is an iterative process that implements Evolutionary Acquisition and delivers incremental warfighting capability.

# Background

- ◆ Evolutionary Acquisition (EA) and Spiral Development (SD) have been in use since the early 1900s.
- ◆ Formally incorporated in to the new Department of Defense 5000 series directives (May 2003) as the preferred strategy and process for rapid acquisition of mature technologies to the user.

# Benefits of EA and SD

- ◆ Reduces cycle time and speeds delivery of advanced warfighting capability
- ◆ Develops and fields manageable pieces (defined as increments or blocks) of hardware and software with demonstrated technologies
- ◆ Provides for continual improvements in capability that accommodates improved technologies allowing for full and adaptable systems over time

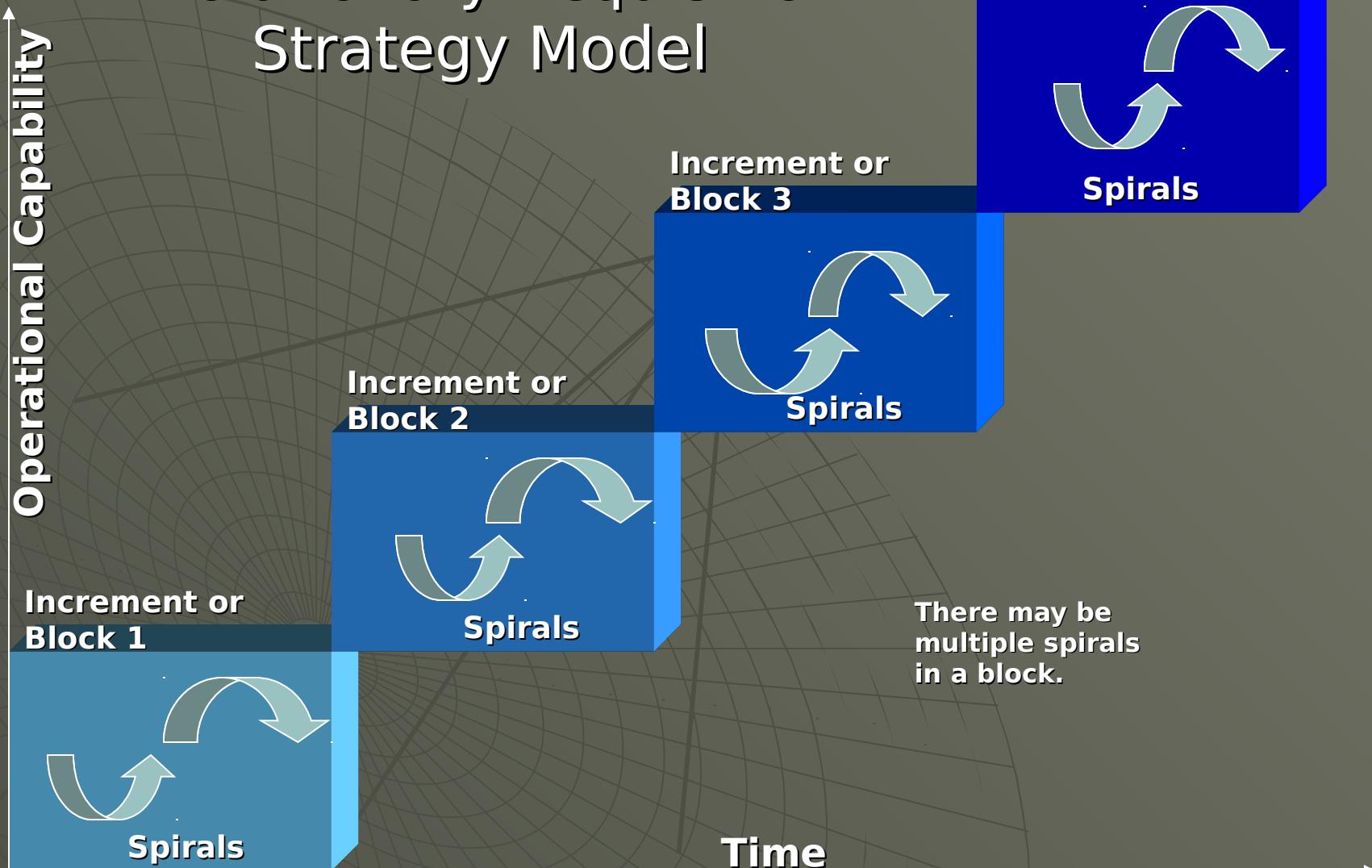
# Implementing Approaches

- ◆ The two approaches to achieve EA require collaboration between the user, tester, and developer.
- ◆ Spiral Development: Desired capability is identified, but the end-state requirements are not known at program initiation.
- ◆ Incremental Development: Desired capability is identified, an end-state is known, and is met over time by developing several increments.

# The Need for Flexibility

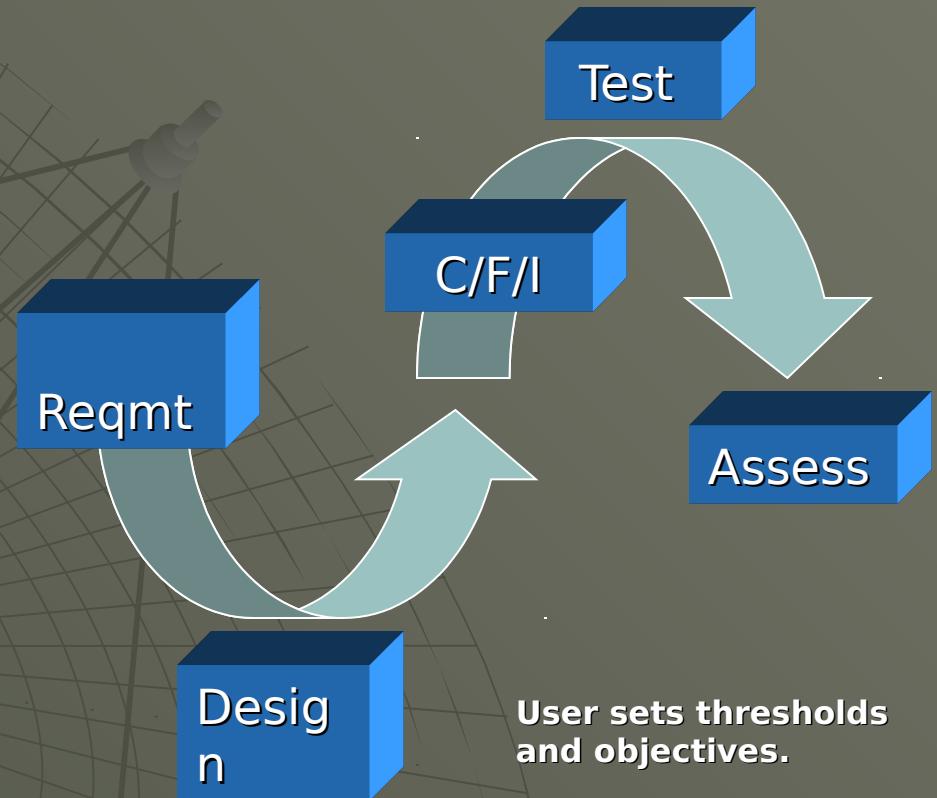
- ◆ Threat changes
- ◆ New missions
- ◆ New users for the system
- ◆ Technology improvements
- ◆ Parts obsolescence
- ◆ Congressional influence
- ◆ Funding issues

# Evolutionary Acquisition Strategy Model



# Inside the Spiral

- **Refine Requirements**
- **Design**
- **Code/Fabricate/Integrate**
- **Experiment/Test**
- **Assess Operational Utility**



**User + Tester + Developer = Realistic Expectations**

# Evolutionary Acquisition Programs

- ◆ Network Centric Collaborative Targeting
- ◆ Unmanned Combat Air Vehicle
- ◆ B-2 Radar Modernization
- ◆ Global Hawk
- ◆ Distributed Common Ground Station
- ◆ Small Diameter Bomb

# Lessons Learned (so far)

- ◆ When in a sole-source environment, early contractor involvement should be the norm.
- ◆ In a competitive environment, a baseline for evaluation needs to be established when the RFP allows program content to move between spirals.
- ◆ Guard against requirements change and unfair advantage when the contractor is allowed to review and comment on requirements feasibility.
- ◆ Work with programmers and budgeters in the Pentagon to resolve EA disconnects, e.g., the move directly from ACTD to SDD.

# Summary

The success of Evolutionary Acquisition and Spiral Development have yet to be fully evaluated. Initial results have been very promising. The strategy and process will continue to evolve.

# References

- ◆ Department of Defense Directives 5000.1 and 5000.2 (May 12, 2003).
- ◆ Kenneth Farkas and Major Paul Thompson, USAF, "Evolutionary Acquisition and Spiral Development," *CrossTalk, The Journal of Defense Software Engineering* (August 2002).
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- ◆ "Evolutionary Acquisition and Spiral Development Processes," *Program Management* (July-August 2003).